Volunteer Firemen

JULY

1940

NATIONAL FIRE PROTECTION ASSOCIATION
INTERNATIONAL
60 Batterymarch Street Boston, Massachusetts

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IT WASN'T THE SPRINKLER'S FAULT

This $200,000 plant was totally destroyed by fire...because human failure *destroyed the sprinkler protection.*

...that this plant burned

When fire broke out, the sprinkler equipment functioned perfectly...

But the watchman, intending to prevent water damage, closed two shut-off valves...before the fire was out, and without summoning the fire department. The blaze quickly regained headway...and by the time the fire department finally was summoned, it was too late.

The moral is obvious: a sprinkler system, no matter how perfect the mechanical equipment, cannot overcome the ability of human carelessness, neglect, intent or stupidity to destroy its effectiveness.

This hazard of human failure is most effectively eliminated through Central Station Electrical Supervision. Had this sprinkler system been so supervised, the fire department would have been summoned *automatically* as soon as the first head opened. Firemen would have been on hand...probably in time to prevent the premature closing of the valves...certainly in time to open them and to help the sprinkler fight the fire before it was beyond control.

* * *

In towns where Central Station Supervision is not available, A.D.T. Waterflow Alarm Service can be provided with connection direct to your fire headquarters. Write for further information and free booklets describing this and other A.D.T. Fire Protection Services.

A.D.T. SPRINKLER SUPERVISORY AND WATERFLOW ALARM SERVICE

Controlled Companies of **AMERICAN DISTRICT TELEGRAPH CO.** *155 Sixth Avenue, New York, N. Y.*

CENTRAL STATION OFFICES IN ALL PRINCIPAL CITIES OF THE U. S.

A·D·T

Electric Protection Services

AGAINST FIRE · BURGLARY · HOLDUP

A NATION-WIDE ORGANIZATION

Volunteer Firemen

National Fire Protection Association

Volume 7 Number 7

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THIS month's cover picture shows volunteers putting a hose line in service at a machine shop fire in Sidney, Ohio. The fire had already gained considerable headway when it was discovered. Valuable time was lost by the firemen in attacking the fire, because they connected their hose lines directly to a double hydrant which had insufficient pressure to make the hose streams effective, instead of using their new 1,000-gallon pumper. When this picture was taken the fire was so beyond control that here the only value of water was probably to wet down buildings which had not already caught fire.

IMPORTANT bulletins regarding defense against subversive activities and against arsonists were issued during June to all fire departments and independent fire companies of Nassau County, New York, by the County Fire Commission. The Commission points out that Nassau County contains important air fields, army posts, airplane manufacturing plants, ordnance depots, and other vital units of national defense. The Commission further calls attention to existing New York state laws providing for the organization of emergency relief and fire police squads to give volunteer firemen proper authority and protection in case of any emergency that may arise. The Commission also solicits the aid of all fire departments in detection and preservation of evidence of arsonist activities.

THE following story was sent in by Chief Herman E. Gutheim of the Cambridge, Mass., Fire Department. It involves a personal experience and Chief Gutheim thought many a fireman would get a good laugh out of it:

"While passing a delicatessen store one evening, a gentleman of Hebrew extraction wearing a white coat and a long white apron rushed out very much excited. He was jumping up and down yelling 'Fire! Fire! Come quick!' I entered his store and found smoke issuing from a large gas oven in which I saw a large ham in a pan all ablaze. I closed the oven door and looked for an extinguisher or pail of sand but could find neither. I entered a hardware store next door and the proprietor had nothing but a pail of dry cement which I took with me. When I re-entered the delicatessen store it was rapidly filling with smoke. Standing to one side of the oven, I opened the door and threw in a few handfuls of dry cement which soon smothered the fire. During this time I was being called a few choice names by my Hebrew friend who said I had ruined his ham. I again closed the oven door, waited a few minutes for the store to ventilate before removing the ham which was nicely covered with hardened cement. I knocked off the cement covering and found the ham perfectly good."

FIRE Commissioner William Arthur Reilly and Commander Frank J. Marr of Fireman's Post No. 94, American Legion, are urging Legion members of fire departments to come to the 1940 convention of the American Legion in Boston, September 22 to 26. Special plans are being made to furnish guide service, club house and parking facilities and in all other ways to make the visit of firemen legionnaires pleasant. Special dormitory facilities in fire houses will also be provided. Fire Commissioner Reilly said, "We ask you to get in contact with Commander Frank J. Marr, Fireman's Post No. 94, A. L., Washington Street near Dover Street, Boston. Notify him what day you plan to arrive, tell him where you have made your reservations and how his committees can be most helpful to you. Come and enjoy the hospitality of the Boston Fire Department."

"A SERIES of Talks for use by Firemen" is the title of a 20-page pamphlet now available. There are five talks, addressed to audiences in (1) a senior high school, (2) a junior high school, (3) an elementary school, (4) a parent-teacher association, and (5) a science class. The pamphlet may be obtained for 25 cents from the Center for Safety Education, New York University, 20 Washington Square North, New York, N. Y.

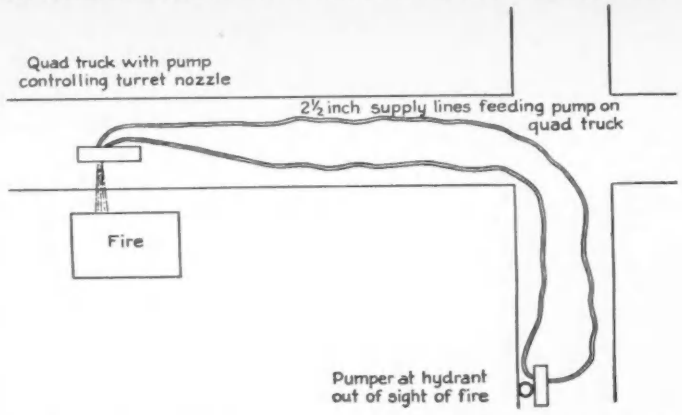
LAST month 6 departments with 69 men joined the Volunteer Firemen's Section for the first time. In addition 27 departments with 663 men renewed membership. This makes the total enrollment 691 departments and 14,650 men. The following departments are newly enrolled:

Corinna Fire Department, Corinna, Maine.
Houlton Fire Department, Houlton, Maine.
Rutherford Fire Department, Rutherford, New Jersey.
Scoresby Hose and Hook and Ladder Company, Ellenville, New York.
Fredericksburg Fire Department, Fredericksburg, Virginia.
Fairview Volunteer Fire Department, Fairview, West Virginia.

THE estimated U. S. fire loss for May, 1940, according to the National Board of Fire Underwriters is $23,446,590. This figure is based on notices of incurred loss received by companies, members of the board, plus an allowance for unreported and uninsured losses. Losses for the first five months of 1940 are $9,869,254 ahead of the losses for the same five months of 1939. The following table shows the losses for each month of 1939 and for the first five months of 1940:

	1939	1940
January	$27,615,316	$36,260,650
February	29,303,520	34,410,250
March	30,682,168	29,788,800
April	27,061,522	26,657,190
May	27,031,700	23,446,590
Total 5 months	$141,694,226	$150,563,480
June	24,190,700	. . .
July	22,468,304	. . .
August	22,800,500	. . .
September	22,837,250	. . .
October	24,300,500	. . .
November	27,248,160	. . .
December	27,959,200	. . .
Total 12 months	$313,498,840	. . .

DEVELOPING HEAVY STREAMS WITH A QUAD


Quad truck with pump controlling turret nozzle
2½ inch supply lines feeding pump on quad truck
Fire
Pumper at hydrant out of sight of fire

By Warren Y. Kimball

QUADRUPLE combination pumper and ladder trucks are largely supplanting the old fashioned service ladder trucks and are giving fire departments much greater flexibility of operation. One of the many situations in which the pump on a quadruple truck proves useful is in helping to develop effective heavy streams through a turret nozzle or deluge set at large fires. The difficulty usually experienced where the turret nozzle pressures must be calculated and controlled from pumpers at distant hydrants, often out of sight of the stream, is avoided by making the quad the control point for heavy stream operation.

In making this layout the quad pulls up in front of the fire and 2½-inch supply lines from another pumper are connected to the intake of the pump on the quad. Fifty-foot lengths of 2½-inch hose from the quad's discharge connections are then connected to the turret pipe or deluge set. In a few departments, the turret pipe on the quad is connected directly to its pump discharge making the use of hose connections unnecessary.

When the connections are made, the pumper at the hydrant keeps the supply lines to the quad filled, but its operator does not have to worry about developing the proper nozzle pressure. He simply gives the full capacity of his machine and the operator at the quad steps up the pressure to the desired nozzle output.

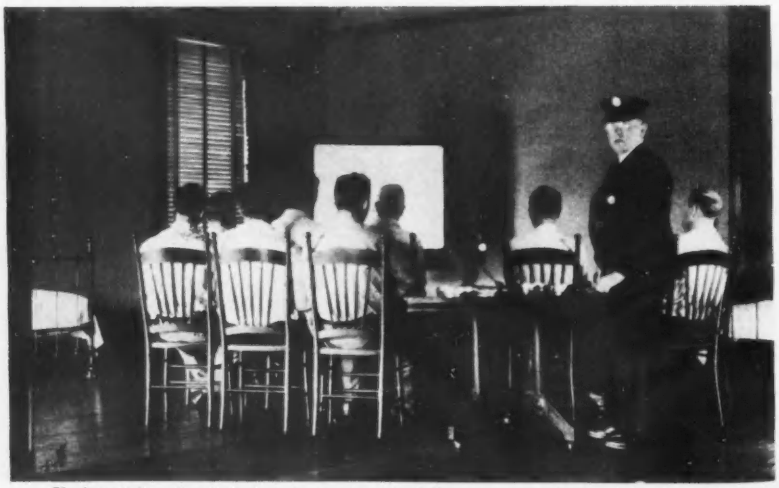
For those interested in the pressures required for this hook-up, the following data will show the greater efficiency of such a relay hook-up for heavy streams over the old method of trying to supply the nozzle pressure from pumpers at hydrants. A satisfactory heavy stream would be one discharging about 600 gallons a minute. This is the amount of water discharged through a 1½-inch nozzle tip at 80 pounds pressure. This means that to supply this stream directly through two lines from a pumper at a hydrant, a 600 gallon or 750 gallon pumper should be ordinarily within 250 feet of the nozzle. Beyond this distance the friction loss in the hose will eat up the pressure wanted at the nozzle, and supply lines from two pumpers will be required. These must each be properly calculated to arrive at the required nozzle pressure or results are likely to be ineffective.

The use of the quad in front of the fire eliminates all such complications and much confusion when developing turret streams. A single pumper at a hydrant as far as 600 to 700 feet away can supply a powerful and effective turret stream through the quad, providing that the pumps are adequate to supply the amount of water needed. Thus when the quad is used to provide the nozzle pressure at the point of operation of the heavy stream, the supply engine can put its full power to deliver full capacity to the quad's pump where the quad's operator controls the stream.

As a word of caution, it should be remembered that attempts to take a hand line from an idle discharge connection of a pumper supplying a turret or deluge nozzle has frequently spoiled the effectiveness of a heavy stream. Practically the full delivery from a 600 gallon or 750 gallon pumper is necessary to supply an effective stream when operating at capacity gear. When pumpers are more distant from the fire and are operating at high pressures, two engines are usually required to supply enough water for the heavy streams. A heavy stream should not be weakened by robbing it at its source of supply.

However, as soon as the large body of fire has been knocked down or driven back with the turret stream, 1½-inch or 2½-inch hand lines relayed through the quad's pump can be advanced to mop up the blaze at close range.

It will be observed that where a quad is not available two standard pumpers can be employed to develop a heavy stream through a similar relay, but where the pump on the ladder truck is used for this purpose a pumper is released for other streams. It is interesting to note in layout illustrated the quad and one pumper are doing the same work that would normally require two pumpers and a service truck.



Cincinnati has found it is not necessary to bring a group of men into the drill school auditorium. Here's the movie man from his office, says Fire Marshal L. G. Schraffenberger, showing a film right in the fire station covering an important matter of general interest to all firemen in the department.

Speaking of Sparks

IT IS a stock warning that the contents of a gasoline container should not be examined by means of a lighted match or other open flame. "Get a flashlight and play safe," is the usual advice. In the April 1940 issue of the *Mutual Engineer*, which is published in Indianapolis, a reader contributed a newspaper clipping which is authority

for the following. One Theodore Mosteller, 25, of Santa Barbara, California, driver of a tank truck, peered, by means of an electric flashlight, into the tank as it was being filled with oil. As he switched on the light a spark occurred which ignited the vapors and Theodore was killed by the ensuing explosion. So now, the editor concludes, we must recommend only a "vapor proof flashlight."

Safe Wiring in the Summer Camp

THIS is the time of year when Americans everywhere have one common desire—to get out of doors. Some are dreaming of the delightful woods of the East, some of the rugged mountains of the West, and still others are looking forward to happy days at the seashore. Open spaces, old clothes, comfortable shoes, and refuge from everyday cares, have nation-wide appeal.

Our plans for improving the summer camp which did not materialize last year, are being taken up again with new ambition. There will be camp roofs to fix, screens to replace, extra rooms to build and electrical circuits to install. It is in regard to plans for this last activity that the International Association of Electrical Inspectors is passing along some suggestions and advice.

If the pump breaks down, water can usually be secured at the neighbors'. If the screens rust through, the worst consequence is likely to be mosquito bites, but if the electrical system fails, either through neglect or improper installation, a fire hazard may develop to endanger the whole camp. It is wise, therefore, to look at the electrical equipment with a critical eye, and the best time to do it, say the electrical inspectors, is now when the camp is being opened for the season. This applies both to private camps and the larger public camps.

In particular, it is suggested that a few minutes be taken to follow the electrical circuit, so far as it is in sight, from the point where it enters the house, to all the outlets. In making this survey, pay attention particularly to the following, and note where improvements need to be made:

1. See if wires outside the house have been damaged by falling branches, or if the insulation has rotted off, or if tree limbs have rubbed against the wires so as to wear away the insulation. If wires have been damaged outside the house, notify the power company. Also see if the insulators are securely fastened to the house.

2. See if metal enclosures of the wires on the outside or inside the house have rusted to a point where they no longer provide mechanical protection. If a ground wire is used to connect the switch box to the ground, see that the terminal connections are clamped securely.

3. Remove the fuses and see that they are in good order and have not been tampered with in any way.

4. Where wires are exposed on wall or ceiling surfaces, see that they have not become loosened from their supports.

5. If switches or switch cover plates have been broken, have them replaced. If receptacles have become loosened, have them tightened, and if they fail to hold plugs securely, have new ones put in their place.

6. Look at all pendant cords. If they show wear to the point of injury to the insulation on the wires, either at the ceiling or at the socket, have the cords replaced.

7. Examine portable lamps to see if socket switches operate properly and if the attachment cords are in safe condition.

8. Replace all lamp and extension cords that are damaged or worn out. In purchasing cords, take special care to obtain those which have the bracelet-like label of Underwriters' Laboratories, Inc., wrapped around them. All cord so labeled complies with safety standards.

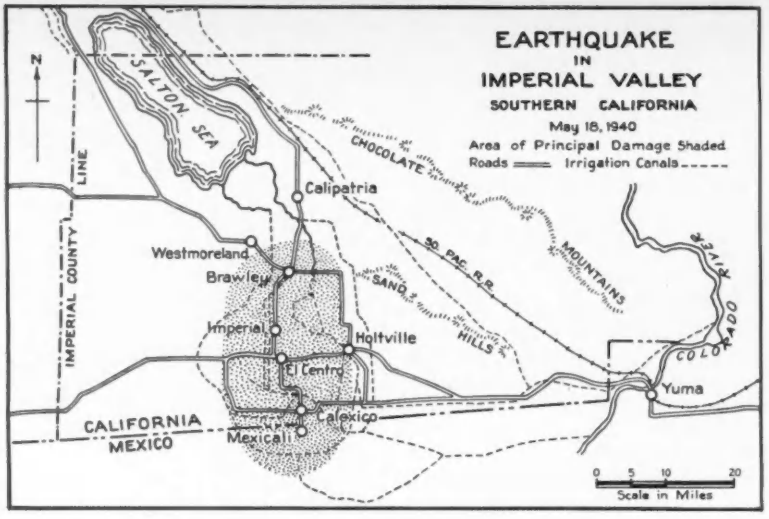
9. To avoid possible shock in damp places, out of doors or in earth-floored locations, see that all insulation is good. For all such locations, use extension cords with substantial rubber sheaths. Use porcelain sockets and insulating switchplates instead of those made of metal.

10. Have all but the simplest repairs done by a competent electrician. Never handle "live" wires. If there is need to work with the electrical equipment, open the main switch first. (Switch is located where the supply circuit enters the house.) Leave this switch open during the winter when the camp is not in use.

Camp is the place for carefree relaxation; avoid all anxiety over its electrical safety by following these simple suggestions.

Firemen often see a fire in this stage. Spectators seldom do because firemen have knocked the fire down by the time they arrive. This fire started with an explosion in a Brooklyn hat shop where cleaning was being done with a flammable liquid.

IMPERIAL VALLEY EARTHQUAKE DISASTER



THE "Most Low-Down Paid Fire Department on Earth" announces the stationery of the fire department of Brawley, California. And before you get the wrong idea, it must be explained that this refers to its unique geographical position, 119 feet below sea level.

There are two southernmost counties in California, bordering Mexico. The easternmost of these two is Imperial County where Brawley is located. It derives its name from the Imperial Valley, noted not alone for being one of the few "lowest" spots in the world but because its desert land, by irrigation, has been transformed into a rich area of farms and orchards.

In this garden spot disaster struck on May 18, 1940. At 8:37 o'clock P. M., citizens were driven from buildings by a slight shock. Heavy shocks at 9:40 and 10:34 P. M. destructively shook the towns of Brawley, Imperial and Holtville. Earthquake experts placed the center of the 'quake near El Centro and the border towns of Calexico and Mexicali. "Faulting" was visible at the surface of the ground from El Centro south into Mexico amounting to 12 feet in spots. By some peculiar quirk of earthquake behavior these communities nearest its epicenter suffered less damage than Brawley and Imperial which were several miles north.

The city hall in Brawley which is also fire headquarters, collapsed. The quarters of most other fire departments in the valley were disturbed. El Centro's fire alarm system was put out of service when batteries were shaken out of their racks.

The only important fire caused by the shocks was in Mexicali. This started in a liquor store and spread to the International Hotel. Firemen from Calexico laid several thousand feet of hose across the border to assist in controlling this fire. A bottle of phosphorus was broken by the heavy 9:40 P. M. shock in the Brawley Junior College. Brawley firemen with gas masks controlled the resulting fire with a small line. The danger of fire following the earthquake was acute but these two were apparently the only fires which directly resulted from it. The death of a Chinese, burned in the International Hotel, Mexicali, was the only fire fatality.

Estimates of the total damage caused by the earthquake varied widely. It will certainly run to several million dollars. In Brawley and Imperial, hardly any buildings were undamaged. The business districts must be practically rebuilt and many buildings need repair. Non-reinforced, unit-masonry types of structures were the weakest in resistance to damage. Reinforced concrete-walled structures, even though not designed to resist earthquakes, stood up better. It has been long known that, by design, a building may be built to resist earthquakes. Numerous new schools, required by law to be so designed, were not damaged.

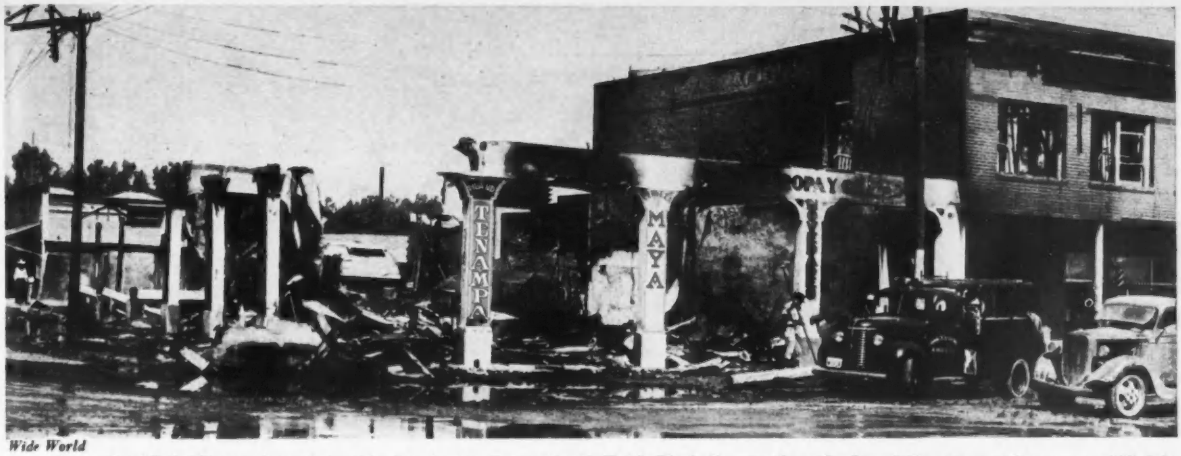
Because the valley is below sea level, water may be flowed into it by gravity. From Colorado River sources, a system of canals allows water to flow into the valley. At present most of this comes from the International Canal and branches, through Mexico. An alternate supply, the all-American Canal, is under construction. The earthquake caused nine major breaks in a 20-mile stretch of the Mexican canals, but no important damage to the uncompleted American route. Cooperative action by U. S. and Mexican authorities made possible restoration of most of the canal supplies by May 23, so that the supplies were impaired for about a five-day period.

More than other parts of the country the valley is dependent on its water supplies. The region would be desert without them. The few days of water shortage occasioned by the disaster caused heavy losses particularly to growers of carrots, melons, alfalfa, tomatoes and squash. Flax and sugar beets escaped damage because their irrigation period was over. In addition, large amounts of water are used in cooling systems for buildings.

Municipal water supplies of the Valley towns take water from the canals, treat it for domestic uses and distribute it through regular systems of mains from pumps and elevated tanks. A fundamental feature in the design of municipal water systems is to consider the most serious break likely and still

Acme

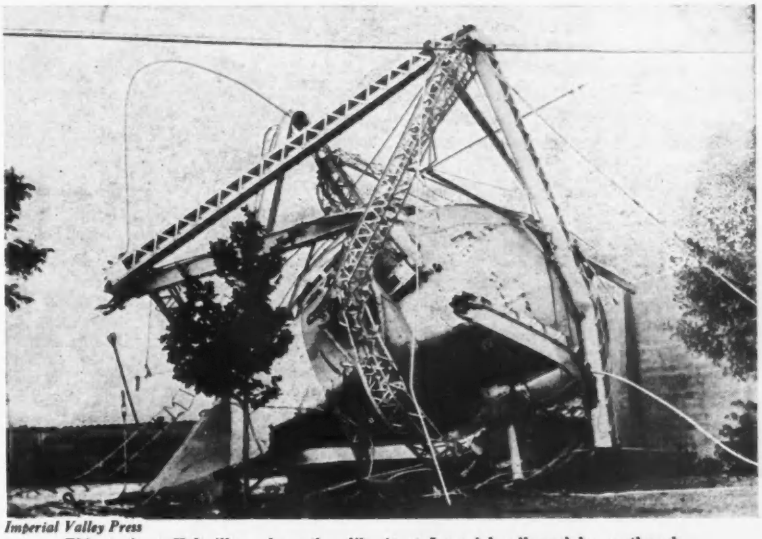
The confusion into which Valley towns were thrown is shown by this picture of damage to buildings in the business district of Imperial.



Wide World

An unidentified Chinese, burned in this fire in the International Hotel, Mexicali, was the only fire victim among nine persons killed in the Imperial Valley earthquake.

have a supply works capable of delivering the necessary water for a period of five days. During this five-day period maximum domestic consumption is assumed. The supply must be sufficient for this domestic flow plus enough so that fire department pumpers can draw on the system for a serious fire. Such fire flow for 10 hours is figured, the rate estimated according to the size of the city. Because their water works were designed on the basis of such calculations, all the cities had enough water. Most of them rationed water for a few days as a safety measure. Had extensive fires occurred, however, the supplies would in some cases have been insufficient, but there was water enough for ordinary fires. Water main breaks were reported at Brawley, El Centro and Mexicali. At Imperial, the municipal swimming pool was kept filled as an emergency water supply.



Imperial Valley Press

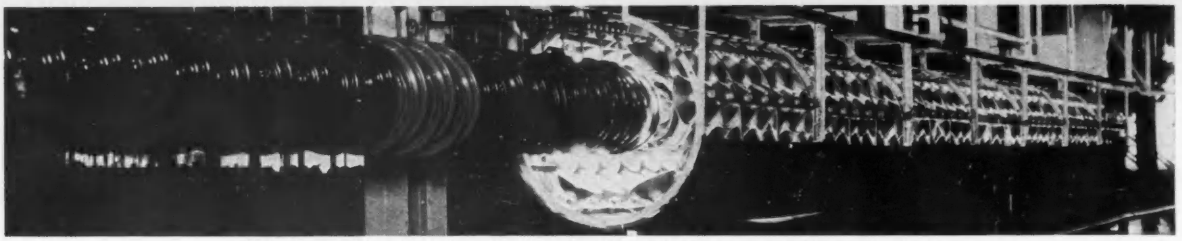
This tank at Holtville and another like it at Imperial collapsed by earthquake.

ALL the affected towns had water storage in elevated steel tanks. To fire protection engineers, the behavior of such tanks is the most important feature of the disaster. There were eight such tanks, two each in Brawley, El Centro and Calexico and one each in Holtville and Imperial. Two were 50,000 gallons, one was 75,000 gallons, three were 100,000 gallons and two were 250,000 gallons capacity. These were on steel frame towers, 75 to 100 feet high. The earthquake gave the ground under them an east-west motion. This motion set up a whipping action in the tower. The towers must be designed to carry the weight of the tank and its water. In addition, they must be braced against horizontal wind loads. The possible earthquake motion causing a whip-action in the tower is a further factor to be considered in the design. Of the eight tanks, two had been designed with an extra ten per cent horizontal load factor to provide earthquake resistance. These stood up without damage. Four towers not so designed are in dangerous condition as the stresses set up by the earth motion stretched or broke the brace rods, especially near the top of the tower. Tanks at Holtville and Imperial succumbed to the earth motion and collapsed completely.

The lesson is that tank towers can be designed to withstand earthquake motion. Besides heavier bracing, another method has been developed as the result of reproducing earthquake motion in the laboratory at the Massachusetts Institute of Technology. This method uses ingenious springs to absorb the shock. These are installed in cross braces. When the structure is "whipped" by earth motion they allow it to "give" sufficiently so that the rods and other members are not stressed to the breaking point.

The forces which act on tank towers from an earthquake are studied at the Massachusetts Institute of Technology.

Thanks for notes on the Imperial Valley earthquake disaster are given to Engineers Engle, Shields and Colton of the Board of Fire Underwriters of the Pacific and to Chief H. L. Stewart of the Brawley Fire Dept.



Drying automobile wheels in infra-red oven at Ford Motor Company's Somerville plant.

NEW TIMES — NEW PROBLEMS

By

ALVAH SMALL, C. E.

It is particularly appropriate to have this timely article from Mr. Small who is the newly-elected president of the National Fire Protection Association. Mr. Small is president of Underwriters' Laboratories, Inc., Chicago.

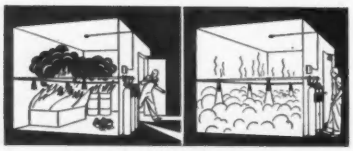
THE second world war is by itself evidence enough that we are facing new times and new problems. One result of the war is that American manufacturers are shipping 37,000 50-foot units of rubber-lined and linen 2½-inch hose for use in England. In areas where aerial bombing attacks are expected, these separate lengths of hose will be attached to hydrants, each length of hose being equipped with a fog nozzle, so that in case of incendiary or gas bombing the fog or spray may be employed either to put out the fire or to wash down toxic or lethal gases.

We have known for years of the efficiency of streams of water and of water fog and spray in removing toxic gases from the atmosphere. The problem was studied, for example, in connection with the Cleveland Clinic fire of 1929. Stocks of cellulose nitrate base X-Ray film in the basement of the Cleveland Clinic became ignited under conditions which promoted heavy decomposition of the film with the release of nitrous pentoxide and other lethal gases. One hundred and twenty-five people were killed. Studies made subsequently showed that had automatic sprinklers been provided in the room where the film was stored the sprinkler water would have taken the nitrous pentoxide gas into solution and carried this and other gases so dissolved into the sewer. Thus a large part of the personal injuries and fatalities recorded would have been saved.

It is thus that problems of the new times are met with the results of our studies of previous disasters. Every year hundreds of new problems are presented to Underwriters' Laboratories, Inc., involving combinations of materials and devices. It is our job to make a true analysis of the problems presented and correctly appraise the sort of steps which must be recommended to prevent these new combinations of things and materials from being hazards to life or property. That is why in my observations here I am stressing certain of the problems of these materials and devices as they appear to the laboratory technician.

Radio signaling has made startling advances, such that the officer in charge of a fire may direct even the pipeman at the far end of the line as to what he should do and how he ought to do it, all by radio. Whether in due time every man responding to a fire, in addition to putting on his helmet, his rubber boots and his rubber coat, will also carry a small two-way portable radio set remains to be seen. The possibilities in that direction are fairly well indicated by the very successful experience that has been had with radio signaling equipment in fire department operations in Chicago and other cities.

There are a multitude of new molded plastic materials. You cannot pick up a national magazine without reading of a new development along that line. Some of these plastics are readily ignitible and are fast burning. When they are involved in a fire will they produce products of combustion that are toxic? Will water vapor in the air be laden with this acid and cause corrosion of machine tools or polished hardware? Some of these plastics are oil resistant, some are heat resistant, some are going to be acceptable in place of rubber, and of other compounded products for gaskets, in pressure regulators, in all kinds of valves—valves in fuel line systems, valves in heat systems, valves in cold systems.



There is much interest in various new materials that have been developed as the result of modern chemical research. There is, for example, the new material that is available as a substitute for silk in women's stockings. It is not necessary for us to give much time to the consideration of whether the material is going to be a success for the purpose. I expect that it is going to look very well. The samples that I have seen do. There are a large number of such synthetic materials and it may be our problem to determine how measurably these new compounds affect our older conceptions of fire hazards and required fire protection.

We have new developments of rubber itself. For example, there are new compounds that actually contain rubber up to 30, 40 and 50 percent but are so compounded with new chemicals and new methods as to be resistant to high temperatures. This development is important in electric wiring as the heat resistance of these compounds is con-

siderably higher than that of ordinary electrical rubber insulating compounds. A piece of No. 14 copper wire, for instance, may be loaded with lamps and fixtures and other current-consuming equipment to the extent that the copper runs at a temperature of 158° F. This is hotter than your hand can stand, but the rubber insulation will continue to be good insulation even at these temperatures.

RUBBER latex applied to fine conductors permits a signal cable, a police traffic control cable or a fire alarm cable to be assembled in a lead sheath with some four times as many individual conductors as has been possible heretofore. In automobiles there is a very large use of rubber compounds for cushioning of motors and for taking vibration out of the car body. In due time engineers will promote the use of rubber cushions, rubber suspensions and rubber springs in a great many applications where fire protection and fire hazard considerations warrant knowledge of the properties of this rubber.

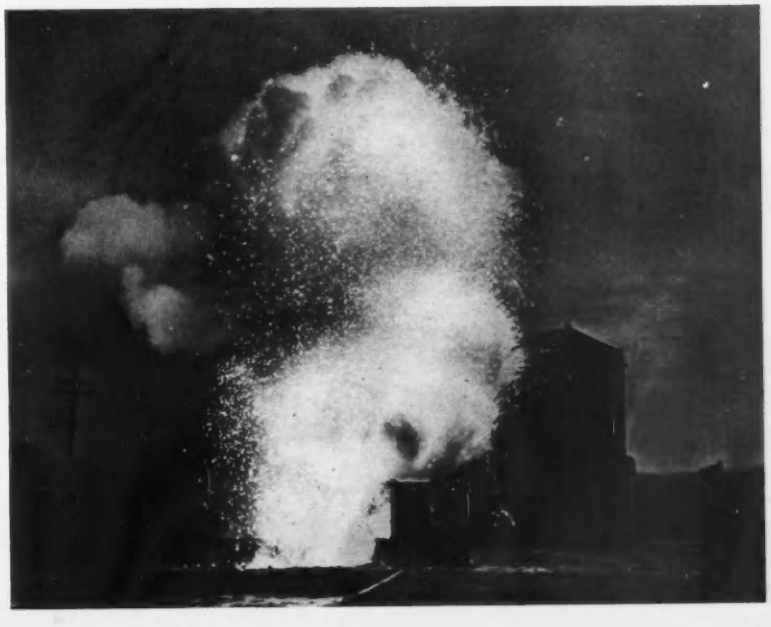
The use of aluminum alloys is increasing. We have the advantage of extruded shapes in aluminum, brass and bronze. These make neat window frames and trim. Many other assembled metal products are possible because of the development of the extrusion processes. Magnesium alloys are also used for cast parts for places in machine assemblies where lightness is of special consideration. Our machine shops now shape rough cast magnesium alloy parts on lathes, borers and other tools. The scrap magnesium alloy turnings involve a severe fire hazard. In many cases it is necessary now to put pans of water under these tools to insure that the scrap will drop into the water and there will be no flashing and ignition of the magnesium due to the heat of the machine operation or of the cutting tool.

Magnesium is the material that was used in the old-fashioned days for flashlight powders and these turnings of magnesium alloys have practically the same swift-burning, almost explosive property of the flashlight powders. Since water on burning aluminum or magnesium tends to give off hydrogen gas, this presents a practical problem wherever fires are ordinarily fought with water.

Another interesting development is the application of infra red heat to certain industrial processes. We have always had infra red heat. It is in the sunlight; it is in almost every light. Infra red heating equipment is used in the Ford plant at River Rouge. There automobile bodies are run through a tunnel that has heating units of 250 watt capacity, each producing infra red heat. These units are screwed into ordinary lamp sockets and the lamp sockets have gold-plated reflectors. Infra red heat is a wave form. Its waves strike through the enamel or lacquer on the car body and heat up the metal. This heating in turn cooks the enamel, baking it satisfactorily and properly in three or four minutes instead of the thirty-five or forty minutes it used to take to put the body through a baking enameling oven. These heating units are doing much to reduce the hazard of this drying operation since their heating effect is not impaired by drafts. It is therefore possible to have good ventilation in the baking tunnels so that concentration of flammable vapors from lacquers and varnishes is avoided.

I have not attempted to deal except in passing with any special problems which the war may present. We still have little or no reliable information on the effect, if any, of incendiary bombs or matters of that sort. A Spanish engineer reporting to a meeting of fire officials studying air defense in England observed that incendiary bombs had been of no importance at all in the bombing of Spanish cities. How much of a factor they have been in the destruction of northern European cities where more wood construction is involved is not yet known. Regardless of what chemicals may be used in incendiary devices of this sort, it is likely that fires set by them will be burning in ordinary combustibles and that present methods may be employed to put out the fires when they start. For other problems that these new times bring we must continue to draw on our experiences with disasters in the past, plus an intelligent estimate based on all available other knowledge.

New fire fighting techniques shown in pictures on opposite page. Sketches in center column show operation of automatic room-flooding carbon dioxide system, courtesy Walter Kidde & Co., Inc. The three shots at bottom of opposite page, left, show an oil transformer fire being extinguished by a system of fixed spray nozzles; two right hand shots show same type of fire attacked with spray nozzles on the end of a regular hose line. Large photo on this page: water has just been thrown on burning magnesium metal with the violent reaction pictured. This photo and spray nozzle photos courtesy Factory Mutual Laboratories. The young lady pictured has gloves and a hat brim of translucent plastic, Santoglass, and the bag is a cellulose acetate plastic, Vuepak, photo courtesy Monsanto Chemical Company. The stockings pictured are made of duPont's new synthetic material, Nylon. Circular photos show comparison of 17-conductor cables showing smaller size made possible by improvements in insulation compounds, photo courtesy Simplex Wire and Cable Company.



Massachusetts Fire Department Inventory

A summary of an address by Mr. G. O. Mansfield, Chief Inspector, Massachusetts Fire Marshal's office, presented at the recent annual meeting of the N.F.P.A. Fire Marshals Section.

THE Fire Marshal's office of the Massachusetts Department of Public Safety has developed a state-wide inventory of fire department equipment that will be available for emergencies. Included in this inventory are 93 different items ranging from costly fire boats to ordinary mops.

The tropical hurricane which lashed across New England in late September, 1938, resulting in more than 500 fatalities and losses by flood, wind, tidal wave, and fire, was one of the reasons for the preparation of the above list. So suddenly did the elements strike, that few communities were prepared for the disaster. In central Massachusetts and New Hampshire fire departments worked at the business of rescuing persons trapped by flood waters of many rivers which had overflowed their banks, due to the heavy rains that preceded the hurricane.

During this crisis, hundreds of inquiries were received at the State Department of Public Safety headquarters regarding the whereabouts of all types of first-aid equipment. From this it became apparent that there was a need for a list located at a central office from which public officials might obtain information about equipment available for emergencies. Included in such a list would be first aid, fire protection, and fire fighting devices; and also the number of men available to use them.

After the hurricane, Fire Marshal S. C. Garrity conceived the idea of an inventory from which anybody who contacted the Department of Public Safety could be told in an instant by whoever was in the office where fire fighting equipment might be secured. To obtain the information needed to compile such an inventory, questionnaires were sent to the fire departments in the 355 Massachusetts cities and towns.

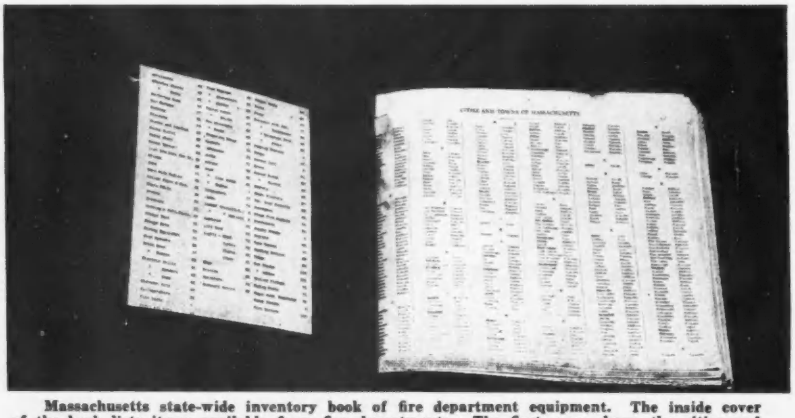
The method used for listing the information obtained is shown in the accompanying illustrations of the "master book." In the inside front cover of this register, appearing alphabetically, are the items that one or more fire departments have available for emergency use. At the right of each unit is a figure referring to that page of the inventory book which contains all the information regarding the location and the amount of that equipment on hand in the state.

The first page of the book contains a roster of the 355 Massachusetts cities and towns listed in A to Z order. Opposite each of these is printed the name of the county to which it belongs. On the next page and on all of the remaining pages, each of the 355 cities and towns are listed alphabetically by counties. The county groups themselves appear alphabetically in vertical columns arranged with adequate space between columns to allow for the writing in of numerical data. At the top of the page is typed the page number and item of equipment. (For example, the illustration shows page 60, Gas Masks.)

The reason for listing the cities and towns by counties alphabetically becomes apparent from the procedure that would have been employed by the Fire Marshal's office to have adequate fire apparatus on hand had a certain incendiary plot been successful. By setting fire to prison work shops and crippling the water supply, convicts at the Concord Reformatory hoped to cause a riot. As a result, the lucky ones would then fight their way to freedom. The plan was discovered and the revolt failed.

Chief Inspector G. O. Mansfield was detailed to prepare the map and inventory shown herewith. With Concord (the location of the prison) as a center two concentric circles were drawn; one was 12 miles in diameter, the other was 30 miles in diameter. Every city or town included or partly enclosed in the circle was listed. A list of types of equipment that would be required for the emergency was drawn up by the Fire Marshal's office. Following this, the inventory was consulted to find what apparatus the different localities had to offer. The accompanying table shows the cities and towns and the items which would have been requisitioned from them had the Reformatory been set on fire. As a result of this inventory, the State of Massachusetts Department of Public Safety is compiling lists to meet such emergencies for all types of public institutions.

In addition to an inventory of equipment the "master book" contains the number of firemen available from each city or town.



Massachusetts state-wide inventory book of fire department equipment. The inside cover of the book lists items available from fire departments. The first page shows the cities and towns of the state and the counties to which they belong.

Typical page of the inventory showing number of gas masks on hand in each city and town.

Chief Inspector G. O. Mansfield's map of cities and towns surrounding Concord Reformatory in Massachusetts.

The advantages accruing from such an inventory are many. Aside from knowing what fire fighting and first aid equipment it does have, the state government of Massachusetts is able to find out what is needed. In matters of national defense, the inventory is invaluable. Necessary equipment can be quickly located in order to deal with fires, floods, or other emergencies caused by sabotage.

However, to be effective the inventory must be kept up to date. In Massachusetts, the register is kept current through the cooperation of the fire chiefs and the efforts of the inspectors of the Fire Marshal's office. Each inspector is responsible for a certain district in the state and he is required to check up from time to time on new equipment that may be purchased or old equipment that is discarded in any of the towns in his district.

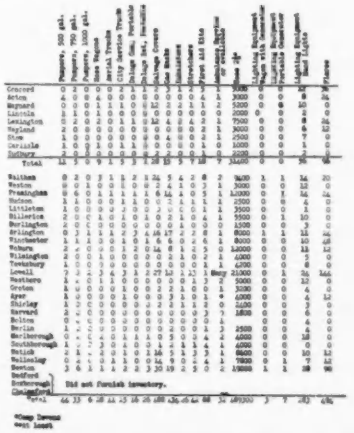


Table of information on city and town emergency equipment obtained from the inventory book at the Department of Public Safety in Boston. Upper totals indicate equipment available within six miles of Concord Reformatory. Lower totals indicate equipment available within fifteen miles of Reformatory.

UTILITY EQUIPMENT FOR ANY FIRE DEPARTMENT

● This comparatively inexpensive unit "fills in" in many important ways to make any fire department, large or small, better able to do its work.

Within its capacity—150 G.P.M. at 100 lbs. pressure—it will do any work required. Readily attached to any passenger car, it will negotiate many roads which a heavy pumper cannot travel. For outlying or farm fires it is therefore ideal.

Also, you will find it useful for dewatering basements or other "clean-up" work after fires or in other emergencies. The self-priming centrifugal pump cannot clog and is not harmed by dirty water.

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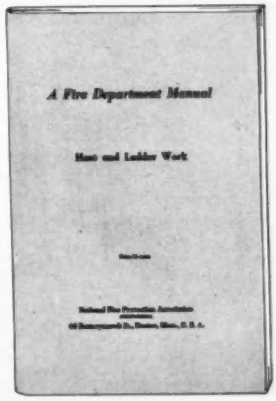
A New Fire Department Manual



HOSE and LADDER WORK

Fire departments are enthusiastic over this new manual on Hose and Ladder Work. A large number of outstanding drill masters and fire department instructors contributed in its preparation, and all of the principal operations involving hose and ladder work are described in detail.

38 illustrations
64 pages 6 x 9 inches

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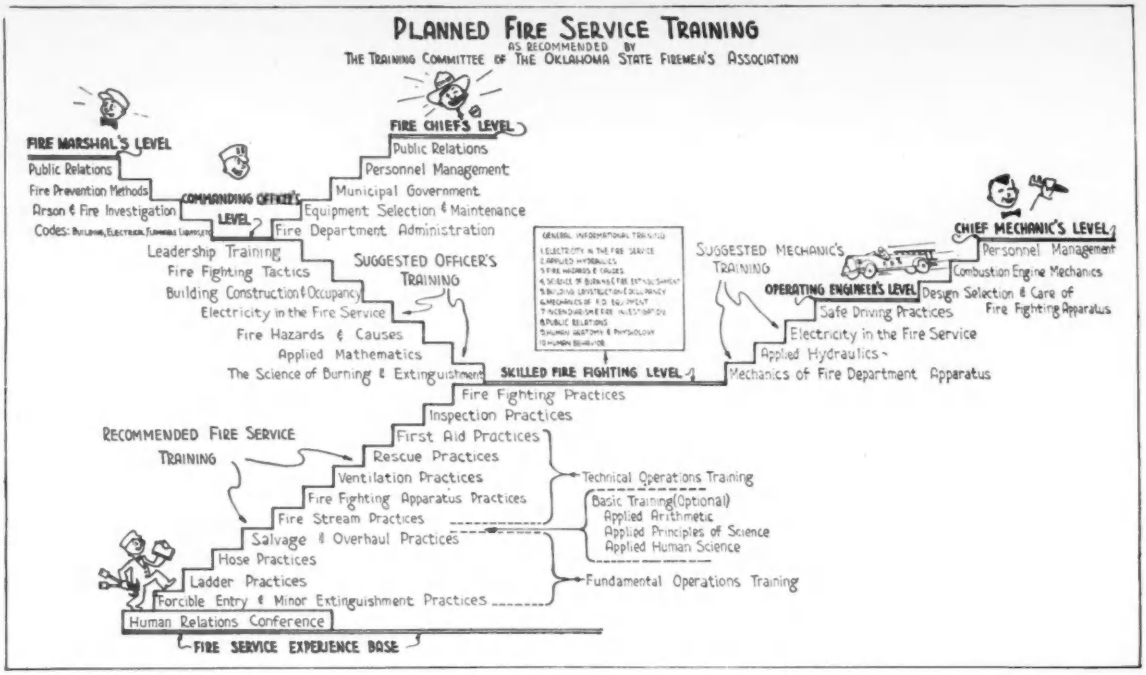
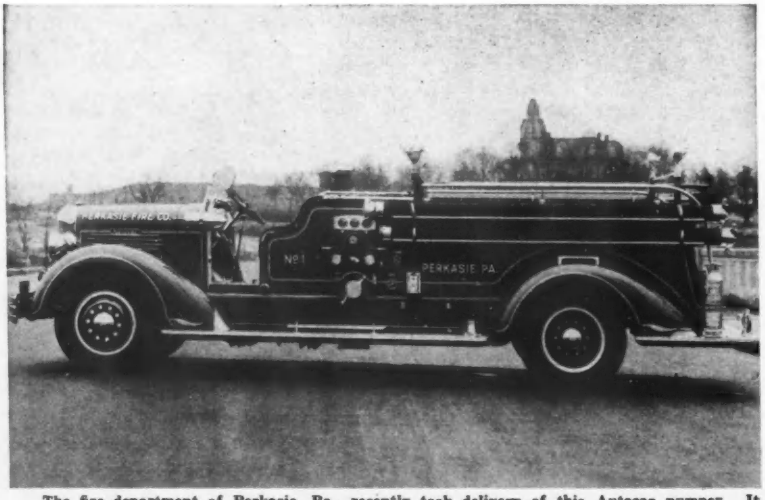


State Fire School Short Courses Summer of 1940

10th Colorado	July 10-13	Glenwood Springs
10th Washington	July 17-20	Port Angeles
7th British Columbia	July 22-25	Victoria
11th Florida	July 22-26	Daytona Beach
10th West Virginia	July 22-26	Morgantown
11th Texas	July 28-Aug. 2	College Station
11th Missouri (S. E.)	Aug. 7-8	Charleston
2nd Pennsylvania	Aug. 26-30	State College
11th Maryland	Sept. 3-6	College Park
10th Kansas	Sept. 10-13	Lawrence



The fire department of Perkasie, Pa., recently took delivery of this Autocar pumper. It is equipped with a 750-gallon pump and a 1000-foot hose body.

Firemen Now Save Houses Instead of Wrecking Them

THE *Texas Fireman* quotes from the El Paso *Herald-Post* the following statement on the progress of fire fighting made by fireman Frank Dalton, recently retired from the El Paso Department after twenty-two years on the job.

"Our firemen have learned to save a house instead of wrecking it. When I joined the fire department back in 1918, we fire fighters weren't taught to regard property. Water damage? It didn't mean a thing to us. Our job was fighting fires, not doing spring housecleaning for somebody.

"Why, when we were called to a building, we broke into it with axes and made the splinters fly. We didn't care whether there was a fire or not. A little bit of smoke was enough of an excuse to batter a door down or break a couple of windows!

"And after we got into the building, then the damage really began! We turned on the hoses and let 'er go. When the smoke stopped, we did.

"Maybe you think we were thoughtless. I don't think it was that. We were never taught anything else, you see. We weren't schooled to be careful. We just put the fires out.

"And that was in 1918. Today things are a whole lot different. Firemen have been taught to go in the door instead of through it. And we are educated to use as little water as possible to put out a fire.

"I think that was the department's biggest step of all."

"Fireproof" Fire Traps

THE modern school building, even when believed to be "fireproof," is often nothing but a modernized fire trap. For example, fire destroyed the one-story junior high school building at Clovis, N. M. This school was considered to be a "fireproof" building with brick walls and a concrete slab roof. From the roof, however, was suspended a combustible fibreboard ceiling. The fire quickly spread over two-thirds of the roof area, warping unprotected steel-supporting members.

Another recent case was a high school built in 1930 at Jacksonville, N. C., valued at $85,000. At Pine Bluffs,

Ark., a fire starting in a locker in the first floor of a high school spread up a nearby air shaft to a band room on the third floor. The fire department did a splendid job, cutting off the fire at the third floor.

The average school, new or old, is too often built to burn. Some of the structural defects are combustible roof spaces, air shafts and ventilating systems. The fires are often serious because little or no provision is made for watchman or alarm service.

The fact that the fires here mentioned were among a number received simultaneously by the N.F.P.A. Department of Fire Record from widely separated parts of the country shows the seriousness of the school fire problem.

ADDITIONAL TRAINING TEXTS

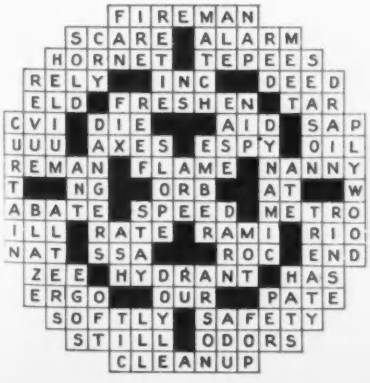
The following fire service training text has been issued for use in the Advanced Training Courses of the Arkansas State Fire College. This is one of the texts prepared by a group of fire department instructors under the direction of W. Fred Heisler. The same text is also available in Oklahoma and Pennsylvania editions.

Forcible Entry and Minor Extinguishment Practices, 8½ x 10¾ inches, with sturdy cover and punched for standard ring binder. 35 pages planographed. Available from Arkansas State Fire College, University of Arkansas, Fayetteville, Ark.

Additional mimeographed sheets have been issued to instructors in the Pennsylvania course of 11 units (given in 18 three-hour sessions) on the Fundamentals of Fire Fighting. These sheets contain suggested lesson plans covering the units: (1) Forcible Entry and Minor Extinguishment Practices, (2) Ladder Practices, (3) Hose Practices and (7) First Aid and Rescue Practices. As these sheets are primarily for instructors, their distribution may be limited. Write the Fire School, Public Service Institute, Department of Public Instruction, Harrisburg, Pa.

CROSSWORD PUZZLE FOR A FIREMAN

Solution



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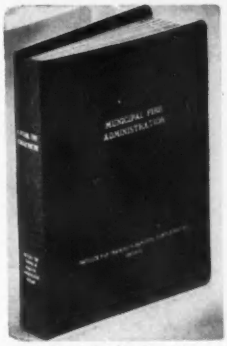

Nominal fee of $25 for the course covers 600 page text, the course of lessons and personal review and correction of lesson papers.

If you are a fire commissioner, city manager, fire chief or fire department officer, or if you hold any other administrative position in your local government, or aspire to such position—

KEEP AHEAD OF YOUR JOB

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FIRE ADMINISTRATION

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Every member receives this handsome membership certificate.

Membership in the N.F.P.A.

Membership with unusual advantages is available to fire companies and fire departments through the Volunteer Firemen's Section of the National Fire Protection Association. Here's the simple plan:

INDIVIDUAL membership in the National Fire Protection Association costs $10 per year. The membership plan for the Volunteer Firemen's Section is designed to give each fire company the advantages of N.F.P.A. membership. The fire company, as a member, receives at its headquarters a complete set of all regular N.F.P.A. literature, including the *Quarterly* magazine, as issued. In addition, as a special service to the Volunteer Firemen's Section, each fire company holding N.F.P.A. membership is entitled to have copies of the magazine VOLUNTEER FIREMEN sent to the home addresses of 10 firemen each month. If more than 10 firemen want to receive the magazine, an additional one dollar should be sent in with the membership fee for each fireman in excess of 10 enrolled.

Because of the large amount of material mailed to members, not less than $10 can be accepted from any company.

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NEW MODEL "Y"
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PYRENE PRIZE LETTER CONTEST

• IT'S EASY TO WIN!

Have you ever put out a fire with a fire extinguisher? If you have you can put yourself in line for a cash prize.

• WRITE A LETTER . . .

That is all that you have to do. Just write us about an experience where an approved extinguisher of any make did good work in stopping a fire.

• RECEIVE $10.00 FOR 250 WORDS

You can, by winning first prize. Decide to be one of the three firemen this month who will take home a cash prize by simply relating an experience with any approved fire extinguisher in this contest sponsored by the Pyrene Manufacturing Company of Newark, N. J., and VOLUNTEER FIREMEN.

• NO RED TAPE . . .

No fancy writing, no formality—merely send your entry to the address given below.

FIRST PRIZE—$10.00

HERMAN HOWERTS,
Racing Team,
Luling Fire Department,
Luling, Tex.

Put Out a 10 by 10 Foot Roof Fire

Last Friday night while my wife and I were on our way to Brenham, traveling in Chief Muenster's official car to participate in the pumper races held there as part of the annual Maifest activities, we heard a bell ringing as we passed through Round Top. This is the smallest incorporated town in Texas, having a population of 125 people. At first we thought it was a train, but later discovered that it was a fire alarm. About half a mile out of town we found a roof fire at a farm house. We unlimbered a pump can extinguisher and a hand extinguisher from the chief's car and put out the fire, which had involved a 10 by 10 foot space on a shingle roof. The owner was saved from a considerable loss.

SECOND PRIZE—$3.00

CHARLES WARD,
Cordele Fire Department,
Cordele, Ga.

Right Extinguisher, Wrong Fluid

Recently our department responded to an alarm sent in from a gasoline service station. Upon arrival at the fire we encountered a dangerous situation for a gas tank truck parked near this station was in flames. The driver of the truck was frantically pumping a hand extinguisher, directing the liquid at the flame. However, it was doing no good.

I was on the first truck to arrive and immediately seized a carbon tetrachloride extinguisher. The driver of the gas truck insisted that my extinguisher would not be of any use. Nevertheless in a few seconds I had the fire under control, and a short time later with help from other extinguishers of the same type we completely put out the fire.

Investigation revealed that the gasoline truck driver's extinguisher had been filled with water.

THIRD PRIZE—$2.00

W. F. HOPKINS,
Wyckoff Fire Department,
Wyckoff, N. J.

Lamp Lights Gasoline

One night at the Newark Airport while in the municipal hangar which was packed with airplanes, I saw a mechanic drop the extension lamp through the bottom opening of a plane. The lamp broke on hitting the floor which had a wet gasoline spot about six feet across. The gasoline flared up and would have communicated to the airplanes had not the mechanic quickly grabbed the hand extinguisher carried in the control cabin of the plane.

The fire was quickly put out with no destruction except for a small amount of smoke damage.

CONTEST RULES

1. Contestants in the Pyrene Prize Letter Contest must be members of their local fire department.
2. Letters are to describe actual experiences where an approved fire extinguisher of any make has saved lives or property.
3. Trade names may be used but will be deleted in publication. Publishers reserve the right to edit winning letters to permit publication.
4. Each contestant automatically vouches for the truth of the facts presented from his own or others' experience.
5. Only one letter may be submitted each month.
6. Letters must be legiby written in ink or typewritten on white paper, one side only. Preference will be given to letters not over 250 words in length.
7. Letters received after the 8th of the month will be judged in following month's competition.
8. Monthly prizes in cash will be: 1st, $10.00; 2nd, $3.00; and 3rd, $2.00.
9. Address contest letters to Pyrene Prize Letter Contest, National Fire Protection Association, 60 Batterymarch St., Boston, Mass.

NFPA Publications

Automatic Sprinkler Systems, Use of by Fire Departments. General principles of fighting a fire in a building equipped with automatic sprinklers.
12 pages, 3 diagrams.....10 cents.

1000 School Fires. A record of 1000 school fires reported to the National Fire Protection Association. Includes the story of the New London, Texas, school explosion in which 276 children, 16 teachers, and 2 visitors perished and 7 other major school disasters involving a total loss of life to 400 persons. Analysis of the fires tabulating causes, type of buildings, places of origin of the fire and the like. Selected reports of typical fires illustrating points of special interest such as the effectiveness of automatic sprinklers and the value of fire drills.
76 pages, 47 illustrations.....35 cents.

Hospital and Institution Fires. A record of 202 hospital and institution fires reported to the National Fire Protection Association. Includes the story of the Cleveland Clinic fire where 124 people died as the result of the hazard of x-ray nitrocellulose film and seven other major disasters involving a total loss of life to 228 persons. Analysis of the fires tabulating causes, type of buildings, places of origin of the fire and the like. Selected reports of typical fires, illustrating points of special interest such as the effectiveness of automatic sprinklers and the value of fire drills.
68 pages, 37 illustrations.....35 cents.

Carbon Dioxide Fire Protection. By Robert S. Moulton, Technical Secretary, N.F.P.A. Use of this form of protection in electrical equipment, manufacturing processes involving flammable liquids, fur vaults and record protection. Characteristics of carbon dioxide, its smothering action on fires, its cooling effect as compared with water and its action on burning gases, liquids and solids. Description of carbon dioxide extinguishing devices, their advantages, limitations and suitability: portable extinguishers, permanent piped installations, electric power house installations, dip tank systems, and room flooding systems.
20 pages, 13 illustrations.....20 cents.

Air Conditioning and Blower Systems. Regulations for the installation of such systems prepared by the N.F.P.A. Committee on Blower Systems. The same systems which convey air and other materials from one part of a building to another will spread fire. The subject is one of tremendous importance to fire fighters but one difficult with which to keep up because of rapid developments. These regulations are just out and give the latest and most up-to-date information. The publication covers not only air conditioning, but also warm air heating systems in residences, and blower systems for removal of flammable vapors and residue, and dust, stock and refuse conveying systems.
32 pages, 11 illustrations.....15 cents.

A Fire Department Manual

Hose

and Hose Couplings

a substantial manual of 44 pages, 6 in. by 9 in., 11 illustrations, containing informative material on the selection, care and testing of hose and hose couplings, compiled from recommendations of N.F.P.A. committees and other authoritative sources.
Single copies .....25 cents.

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Keep Your Home From Burning. Colored folder 3½ x 6½ inches illustrated in two colors. Price $1.50 per hundred. Sample copy furnished free.

Rural Fire Departments. A pamphlet prepared by the N.F.P.A. Committee on Farm Fire Protection. It contains suggestions regarding equipment and specifications for apparatus in rural fire departments, the organization of such departments; a form of ordinance under which a voluntary fire department may be organized and rules for its operation; also suggested state legislation for fire department organization.
32 pages.....20 cents.

Water Systems for Fire Protection on Farms. A pamphlet prepared by N.F.P.A. Committee on Farm Fire Protection to suggest ways and means for the most efficient utilization of available water supplies in extinguishing farm fires and to present essential features needed to give reasonably adequate fire protection when new water systems are contemplated.
12 pages, 7 illustrations .....10 cents.

Lightning, Code for Protection Against. Nine tenths of the 400 annual deaths from lightning and a large percentage of the property loss due to lightning occurs in rural districts. Lightning rods have demonstrated that they will give buildings positive protection from lightning if properly installed. This publication shows how to install them. Also covers lightning protection for smokestacks, aircraft, ships, trees and live stock in fields.
40 pages, 5 illustrations .....15 cents.

Common Hazardous Chemicals, Table of eighty-two of the more common chemicals dangerous in fire fighting. Points to be considered in fire fighting are given for each, together with a description of the fire and life hazard. The table gives the usual shipping container and outlines safeguards for each chemical during storage. This publication is a joint product of the N.F.P.A. Committee on Hazardous Chemicals and Explosives, and the American Chemical Society.
Fourth Edition, 24 pages.....20 cents.

A Model Records and Reporting System for Fire Departments

Size of book, 8½ x 11 inches
87 pages, 27 forms, 7 figures
Price, $2 each, postpaid

This manual suggests a detailed and well-rounded plan that should help to solve many of the problems that now confront fire chiefs in small as well as large cities and towns. It shows how a records and reporting system should operate. It includes copies of the 27 forms considered important in fire department work.

The record forms contained in this book have met with such acceptance by fire chiefs and fire departments that most of the forms have now been separately printed to meet the demands of departments wishing to purchase supplies of the blanks. Write for a price list for the various record forms. If your department has not yet obtained a copy of the Model Records and Reporting System book ask for a circular describing it so that you will have full information on the many reporting blanks available.

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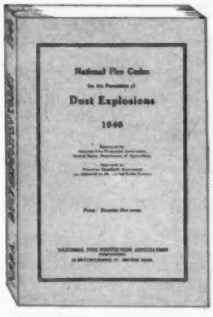

136 pages
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NATIONAL FIRE CODES

for the prevention of

DUST EXPLOSIONS

It contains:

(1) Safe methods for fighting fires in some common flammable and explosive dusts.
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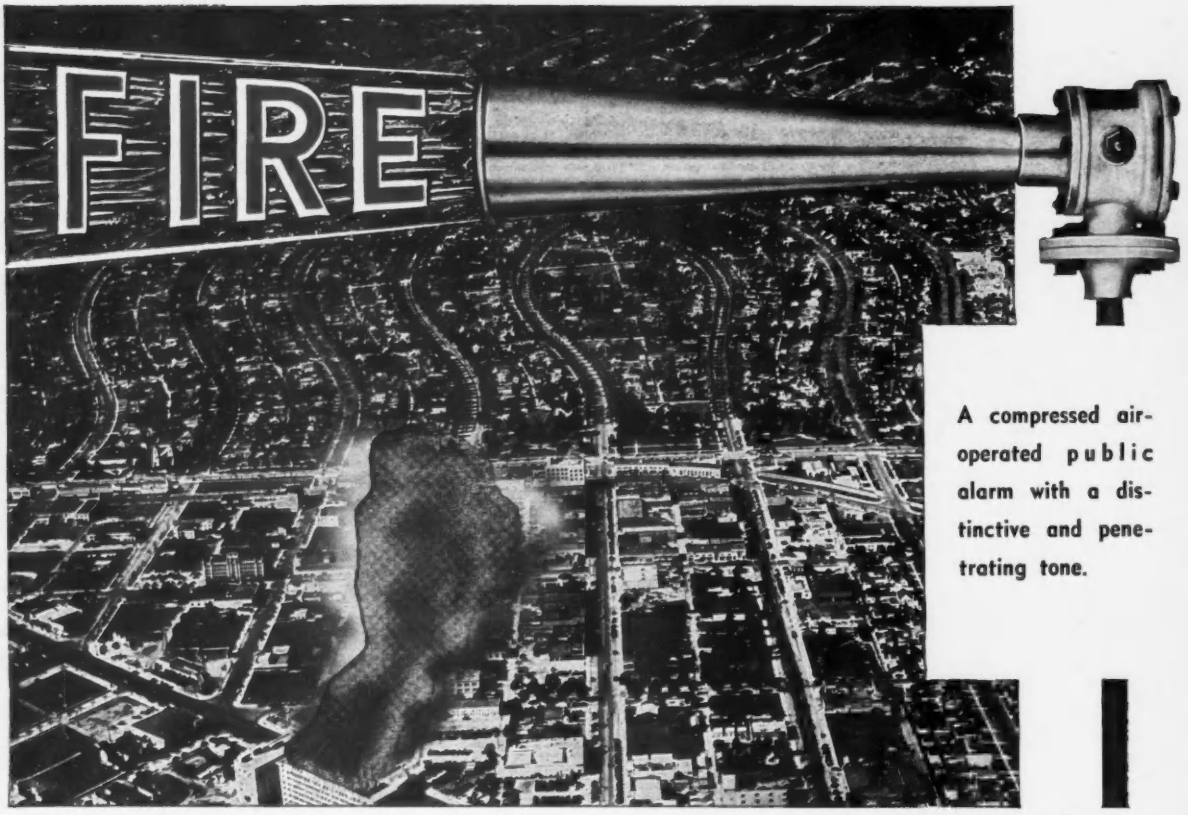

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